

US-PAT-NO: 4818833

DOCUMENT-IDENTIFIER: US 4818833 A
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TITLE: Apparatus for radiantly
heating blade tips

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US Patent No. - PN (1):
4818833

Detailed Description Text - DETX (13):

The temperature of the blade 14 during the sintering process is further controlled by insulation which shields the airfoil and root portions 18, 16, respectively, from the radiant heat source 36. In particular, a tantalum metal shield 38 surrounds the airfoil portion 18 of the blade 14, and rests upon a support 40 which extends from the blade root fixture 30. The shield 38 is a box-shaped structure having an airfoil shaped cut-out 39a in its top surface 4 through which the blade tip 12 extends. The shield 38 acts as a heat reflector, and also is stuffed with a heat insulative material 43 which provides, further protection for the airfoil and root portions of the blade 14. The shield 38 is preferably constructed from a sheet of thin tantalum metal, about 0.5 millimeters (0.02 inches) thick. Tantalum is particularly desired

because of its excellent reflective characteristics, and because it is readily formed into complex shapes. The shield could also be made from other materials, including ceramics. Spaced slightly below the top surface 41 of the shield 38 is a shelf or support 48, also fabricated from tantalum, and which is joined (e.g., by spot welding) to the sides of the shield 38. The shelf 48 includes a cutout 39b through which the blade 14 extends; layers of graphite felt 43a rest upon the shelf 48, providing additional thermal protection to the shielded tip portion 20 of blade 14. FIBERFAX.RTM. insulation 43b (the Carborundum Company, Niagara Falls, N.Y.) fills the interior of the shield 38 below the shelf 48. Other suitable insulating materials will be apparent to those skilled in the art. Layers of rigid insulating materials 44, 46 also shield the blades 14, as well as the fixture 30 and heat sink 32 from the heat source 36. A first insulation layer 44 is secured to the lower surface 48 of the graphite susceptor 36, and second insulation layer 46 rests upon the support 40. A layer of rigid insulation 50 rests upon the top surface 52 of the susceptor 36.

Current US Original Classification - CCOR (1):
219/634

Current US Cross Reference Classification - CCXR
(1):
219/635

US-PAT-NO: 5760379

DOCUMENT-IDENTIFIER: US 5760379 A

TITLE: Monitoring the bond line
temperature in thermoplastic
welds

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US Patent No. - PN (1):
5760379

Brief Summary Text - BSTX (46):

The system of the present invention uses sliding junction multinode (M-N) thermocouples extending along the bond line in a layer overlying the susceptor with a thin film of thermoplastic for insulation to separate the thermocouple from the susceptor. The thermocouple is made by twisting the wires together or in a zig-zag fashion, as shown in FIG. 3, to form periodic nodes along the bond line. A single wire thermocouple configuration using constantan wire and using the copper susceptor as the second conductor is shown in FIG. 2 and 7. The spacing of the nodes depends on the desired resolution, but, should be about 0.2 inch or so apart.

Current US Original Classification - CCOR (1):
219/633